

**ROBERT S. WELCH CENTER FOR GRADUATE AND PROFESSIONAL STUDIES
GOUCHER COLLEGE
TEACHERS' INSTITUTE
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Syllabus

AP 510.300 - Preparing Students for Advanced Placement® Calculus BC

This workshop provides teachers with the tools they need to implement effective AP Calculus BC course. During this training, teachers will explore the mathematical practices for AP Calculus (MPACs) and the components of the curriculum framework, including the big ideas, enduring understandings, learning objectives, and essential knowledge. Participants will understand how to use activities that organize the course content to develop students' proficiencies in the skills identified by the curriculum framework. In addition, participants will work on a course plan that will help them decide how they will teach the skills and content of the AP Calculus BC courses.

Participants will be expected to collaborate and participate fully in the proceedings of the course and will be encouraged to create a network of support. There will also be opportunities for participants to review and enhance their understanding of the content of AP Calculus BC.

Instructor: Dr. Jim Bohan, Ed.D

bohan.educ@gmail.com – please state “Goucher AP Calc BC” in subject line

Summer 2017

Tentative Times	Monday	Tuesday	Wednesday	Thursday	Friday
8:00	Introductions Expectations	Feedback MC Discussion Questions Technology	Feedback MC Discussion Questions Technology	Feedback MC Discussion Questions Technology	Feedback MC Discussion Questions Technology
AM	Workshop Procedure and Assignments Course and Exam Description (CED) <ul style="list-style-type: none">• About AP• Curriculum Framework• MPAC Practices	Course and Exam Description (CED) <ul style="list-style-type: none">• Instructional Approaches• Resources Big Idea 2: Derivatives <ul style="list-style-type: none">• Content Check	Big Idea 3: Integrals and the Fundamental Theorem <ul style="list-style-type: none">• Content Check	Big Idea 4: Series <ul style="list-style-type: none">• Content Check	The 2017 Test
PM	Big Idea 1: Limits <ul style="list-style-type: none">• Content Check• Exploration of Problems	<ul style="list-style-type: none">• Exploration of Problems	<ul style="list-style-type: none">• Exploration of Problems	Scoring Practice Exam Free Response Ask the Pros – Panel Discussion	

No text is required but participants are strongly recommended to bring whatever text they will be using when they teach AP Statistics.

Course Objectives

Link the Mathematical Practices and Enduring Understandings to the overarching goals of the course.

- Identify the content and skills for success on the AP Exam.
- Identify key words and information in the question stem that would indicate which understandings and skills a student might need to demonstrate in order to earn a qualifying score.
- Connect Essential Knowledge statements with their corresponding Learning Objectives, and Learning Objectives with the Enduring Understandings those objectives align to.
- Identify how Exclusion Statements might impact their planning for the course.
- Identify concepts or skills that are referenced across multiple Big Ideas, as well as implications for course planning.
- Develop an instructional plan that builds toward the enduring understandings and incorporates the mathematical practices.
- Explain why the MPACs are listed separately from the Learning Objectives in the Concept Outline.
- State explicitly the mathematical processes used when solving an AP Exam problem.
- Determine which MPACs could be aligned with a particular Learning Objective.
- Identify ways that a student can demonstrate proficiency in each subskill for a given MPAC.
- Identify instructional strategies that would model the subskills explicitly.
- Differentiate between tasks that provide more scaffolding versus those that provide less.
- Develop tasks that would scaffold an MPAC across multiple Learning Objectives.
- Identify the connections among MPACs and between MPACs and LOs that may influence the sequence in which they are introduced.
- Identify challenging skills that should be introduced early and revisited often.
- Identify the characteristics of a “calculus-based” justification in a variety of free response questions.
- Compare student responses showing varying levels of performance on questions requiring justifications or reasoning.
- Identify instructional strategies that can support the development of mathematical communication skills.
- Identify calculus topics for which prerequisite knowledge and skills would impact student success.
- Identify strategies for addressing gaps in prerequisite knowledge and skills.
- Adapt or modify an existing AP exam item for appropriate use in different contexts.
- Examine rubrics for patterns of emphasis.
- Identify resources that reinforce calculus content and mathematical practices.
- Identify resources that target specific student needs or misunderstandings.
- Identify instructional strategies that can help make content more meaningful and accessible to students.
- Build units of instruction that align assessment with learning goals and instructional practices.
- Identify formative assessment strategies that can gauge student understanding during the learning process and inform next steps for instruction.
- Write effective feedback for a variety of student responses.
- Identify the curricular requirements and AP course audit options for AP Calculus.
- Identify next steps and resources that will help prepare participants to teach AP Calculus, and better equip students to be academically prepared for AP Calculus.

Graduate Programs in Education Outcomes:

GPE001: Knowledge - Theory: Apply knowledge of psychological and educational theory, research, and/or philosophy related to the area of specialization or certification.

GPE002: Knowledge - Assessments: Demonstrate understanding and use of the types of assessments appropriate to the area of specialization or certification.

GPE005: Skills - Theory: Demonstrate the ability to incorporate theory and research into practice related to the area of specialization.

GPE006: Skills - Data: Demonstrate the ability to gather appropriate data and use data in problem analysis and decision-making related to the area of specialization.

GPE007: Skills - Problem Solving: Use problem solving/critical thinking strategies appropriate to the area of specialization.

GPE008: Skills - Reflection: Use reflective practice within the area of specialization.

GPE009: Skills - Communication: Demonstrate effective communication and presentation skills related to the area of specialization.

GPE010: Skills - Technology: Use a variety of technologies appropriate for working in the area of specialization.

GPE012: Dispositions - Diversity: Demonstrate positive dispositions toward diversity and equity.

GPE013: Dispositions - Professionalism: Demonstrate professionalism in one's demeanor, behavior, conduct, decision-making, and interactions with colleagues.

Bibliographical references and complimentary text books will be shared in class. Please plan to share activities, websites, and strategies during the institute. All submissions will be compiled and distributed to all.

Requirements for Graduate Credit – all documents must be submitted electronically at the end of the institute or within two weeks of the completion of the institute. Use the email address listed above.

- Completion of Essential Concepts Outline of the Four Sections of AP Calculus BC.
- Creation of an action plan for implementation of concepts and procedures learned from the course.
- Evaluation of the course.

If you are taking the course for credit, no absences are permitted.

You must attend full time on all five days to receive graduate credit.

Instructions to receive a copy of Credits Earned after the completion of the course:

- *Goucher College does not issue grade reports. You can obtain your grade approximately 3 weeks after concluding the course by going to the Goucher website (mygoucher) and follow the prompts to receive your grade.*
- *If you need a paper copy of grades for tuition reimbursement, you will need to request a transcript in writing. You can fax your request to Student Administrative Services (SAS) at 410-337-6504 or mail to SAS at*

*Goucher College, SAS
1021 Dulaney Valley Road
Baltimore, MD 21204*

There is no charge for this request. Please allow 3-5 working days to process. To access the transcript request form, please go to

<http://www.goucher.edu/x1891.xml>

Questions? Please call Shelley Johnson or Barbara Bisset at 410-337-6200.